Solicitation Number: USSOCOM RFI TE 19-1_Technical Experimentation: Hyper-Enabled Operator and Small Unmanned Aerial Systems (SUAS)

Notice Type: Special Notice

TYPE: A–Research and Development

NAICS: 541715 (Research and Development in the Physical, Engineering, and Life Sciences)

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Response Date: 10 September 2018, 12:00 Noon Eastern Time.

Synopsis:

A. INTRODUCTION: Technical Experimentation (TE)

This Request for Information (RFI) is NOT a solicitation for proposals, proposal abstracts, or quotations. The purpose of this RFI is to solicit technology experimentation candidates from Research and Development (R&D) organizations, private industry, and academia for inclusion in future experimentation events coordinated by the U. S. Special Operations Command (USSOCOM). USSOCOM invites industry, academia, individuals, and Government labs to submit technology experimentation nominations addressing innovative technologies leading to possible Government/Industry collaboration for development of USSOCOM technology capabilities. The intent is to provide participants with the opportunity to gain Special Operations Forces (SOF) insight/perspective on participant technologies. For this TE event, technology experiment nominations will be submitted via the Vulcan platform. Respondents should pay particular attention to the instructions in paragraph C below.

Technical experimentation will explore emerging technologies, technical applications, and their potential to provide solutions for future SOF capabilities.

This RFI is for TE 9-1:

- Date: 5 through 9 November 2018
- Themes: Hyper-Enabled Operator and SUAS
- Location: Avon Park Air Force Range, FL

B. OBJECTIVE:

1. Technology experimentation events provide an opportunity for respondants to interact with operational personnel to determine how their technology development efforts and ideas may support or enhance SOF capability needs. The environment facilitates a collaborative relationship between Government, academia, and industry to promote the identification and assessment of emerging technologies.

2. The deadline for nomination package(s) is 10 September**, 2018 at 12:00 Noon Eastern Time**. After review of the TE nomination submissions, the Government may invite select candidates to demonstrate their technologies at the USSOCOM sponsored TE event. Experiments will be conducted from 5-9 November 2018, at Avon Park Air Force Range, FL, and will explore emerging technology solutions and revolutionary improvements in relevant technologies. Materiel solutions brought to the event should

be between a Technology Readiness Level (TRL) of 3 and 6. Proposed experiments may be between a half day and two days in duration and may be conducted in unimproved expeditionary-like conditions. At the discretion of USSOCOM, respondents may be asked to complete a vendor loan agreement (VLA) (RFI Notice Attachment 4). There is no intention on the part of USSOCOM to purchase or procure equipment based solely on participation in the TE.

3. Experimentation Focus: The primary intent of this event is to highlight technologies that support USSOCOM's Hyper-Enabled Operator concept and SUAS.

4. Technology areas to explore during the event include the following:

4.1 Information Edge. Ability to process data from wide array of sensor networks, communications channels, or partnered forces into information that is decision quality information.

4.1.1 Edge computing. Ability to derive useful information at the point of collection through sensor fusion and forwards processing without reliance on high-bandwidth, long haul communications.

4.1.2 Information visualization. Tailored information visualization that provides the right information, to the right element, at the right time. Includes tailored Heads Up Display (HUD), audio, haptic feedback, and predictive information management to identify and present relevant information during each phase of an operation.

4.1.3 Data transport with reduced vulnerability to intercept and detection, including optical and non-RF solutions.

4.1.4 Cross domain data access. Systems to securely run advanced data analytics across data sets on different domains.

4.2 Next generation Intelligence, Surveillance, Reconnaissance (ISR). Technologies of interest include the ability to:

4.2.1 Find, fix, finish, exploit and analyze.

4.2.2 Without owning the air domain.

4.2.3 Includes the space and/or cyber domains.

4.2.3.1 Exploit the cyber domain and digital patterns of life on social media to support ISR missions.

4.2.3.2 Includes high-altitude persistent solutions between traditional air and space.

4.2.3.3 Exploit the space domain to "fix and finish," to include on-demand payloads.

4.2.4 Ability to exchange data with distant sensors to perform Time Difference of Arrival/Frequency Difference of Arrival geolocation.

4.2.5 Enabled by advanced automation advanced standoff multi-modal biometrics, real-time sensor fusion, action detection, and "smart systems" that tailor collection focus and fidelity based on requirements.

4.2.6 Small, low power autonomously emplaced ground sensors capable of meshed operation and long-dwell. Tailorable sensors including electro optical, infrared, Hyper Spectral Imaging (HSI), LIDAR, electronic warfare, and others capable of contributing to biometric analysis from 200-1000 meters.

4.2.7 Precise time and position correlation to full motion video.

4.2.8 In modular payloads that permits installation across full range of SUAS in the next section.

4.2.9 Leveraging Human Language Technologies (HLT) to:

4.2.9.1 Reduce operator workload.

4.2.9.2 Reduce communications bandwidth requirements.

4.2.9.3 Increase probability of detecting specific speakers.

4.2.9.4 Increase effectiveness of unfamiliar languages.

4.3 Small Unmanned Aerial Systems.

4.3.1 Expeditionary ISR. Family of group 1-2 UAS's, featuring modular payloads, open architecture, small footprint and minimum logistics support.

4.3.1.1 Line of Sight (LOS) and beyond LOS data link.

4.3.1.2 Accurately locate targets.

4.3.1.3 Runway independent launch and recovery.

4.3.1.4 Two sensor capable, (e.g. high definition full motion video, electro optic/ infrared, electronic warfare, signals intelligence, HSI, LIDAR).

4.3.1.5 Autonomous operation, including meshed swarm capabilities.

4.3.1.6 Alternative power through environment (power lines, renewable, etc.).

4.3.2 Unmanned aerial blood delivery system. System must be vertical takeoff and landing capable (VTOL) or runway independent. USSOCOM will provide a blood surrogate for the event.

4.3.2.1 Systems should be capable of transporting a minimum of 10 pounds of blood.

4.3.2.2 The cold chain must be maintained and monitored throughout flight. Blood must be kept at 2-8 degrees Celsius from time of loading, transit, delivery, and unloading. Systems using passive cooling are preferred.

4.3.2.3 Consideration must be taken to minimize shock to blood payload for any proposed delivery concept.

4.3.2.4 System must have an operational range of 100 or more miles. Command and control of the aircraft must be maintained at all times.

4.3.3 Nano VTOL UAS

4.3.3.1 Extremely small, lightweight Nano VTOL UAS with a takeoff weight of 75 grams or below are desired with the following characteristics.

4.3.3.2 Day and night imaging capability.

4.3.3.3 Autonomous flight modes.

4.3.3.4 Indoor flight capability with augmented collision avoidance, operator in the loop control.

4.3.4 Micro VTOL UAS

4.3.4.1 Small, lightweight micro VTOL UAS with a takeoff weight of 750 grams or below are desired with the following characteristics.

4.3.4.2 Day and night imaging capability.

4.3.4.3 All-weather capability.

4.3.4.4 Autonomous flight modes.
4.3.4.5 Autonomous indoor flight capability with collision avoidance.
4.3.4.6 Operation in Global Positioning System (GPS) denied environment and confined spaces (including subterranean).

4.3.5 Small Fixed Wing UAS
4.3.5.1 Hand launchable or VTOL fixed wing UAS with no launch or recovery equipment (bungee, net, etc.) is desired with the following characteristics.
4.3.5.2 VTOL configurations not to exceed 3.5 kg takeoff weight.
4.3.5.3 All-weather capability.
4.3.5.4 Day and night imaging capability.
4.3.5.5 Autonomous flight modes with GPS denied capability.
4.3.5.6 Minimum of 90 minutes endurance at sea level.

4.4 Managed signature. Technologies of interest are those that help avoid physical detection by acoustic, thermal, radar, visual, optical, electro-magnetic, virtual, and near infrared means.
4.4.1 Technologies which help manage digital presence within the realm of social media.
4.4.2 Technologies that assist in providing resistance to biometric tracking.
4.4.3 Technologies that exploit publicly available information to obscure or deceive to deny information about actions and intentions.

4.5 Next generation Military Information Support Operations (MISO). Technologies should be operable in limited or denied connectivity environments.
4.5.1 UAS/drone supported broadcasts.
4.5.2 Linguist expertise and regional dialects.
4.5.3 Demographic and culturally adaptive.
4.5.4 Operable in multiple spectrums, e.g. microwave, IR, etc.
4.5.5 Real time feedback.
4.5.5.1 Biometrics and patterns of life.
4.5.5.2 Data analysis.

4.6 Human Performance and Biomedical. The optimization of SOF operator's ability to perform at very high levels for long durations, process information and make the right decisions in a timely manner, while operating in extreme environments, under high levels of stress will significantly improve their operational effectiveness. SOF requires the capability for far-forward austere casualty care to sustain critically injured personnel until they can reach the next higher level of care. SOF medical personnel place a premium on medical technologies that are small, lightweight, ruggedized, modular, multi-use, and designed for operation in extreme environments. The equipment must be easy to use, require minimum maintenance, and have low power consumption. Drugs and biologics should not require refrigeration or other special handling.
4.6.1 Enhanced cognitive performance

4.6.2 Increase peak performance sustainability, including increased endurance, strength, energy, agility, and enhanced senses.

4.6.3 Improve sleep and/or provide restorative effects of sleep.

4.6.4 Reduce recovery time.

4.6.5 Medical sensors and devices that provide vital sign awareness and send alerts.

4.6.6 Austere trauma treatment.

4.6.7 Reduce injuries and promote faster return to duty.

5. Security/Classification Requirements: Respondants shall not submit classified information in the technology experimentation nominations.

6. Safety Requirements: All respondents shall review TE Safety Guide (RFI Notice Attachment 2). Those respondents who are invited to demonstrate their technologies must complete a Deliberate Risk Assessment Worksheet (Department of Defense Form 2977) (RFI Notice Attachment 3) in accordance with MIL-STD-882E and the Department of the Army Techniques Publication No. 5-19 (ATP 5-19). Risk assessments shall be emailed directly to the **tech_exp@socom.mil** by **12 October 2018**. Respondents should include instructions that describe the safe operation of the device nominated for the experiment. Respondents wishing to conduct experiments of a kinetic or energetic nature are responsible for ammunition and/or explosives shipments to include an Interim Hazard Classification (IHC) or Final Hazard Classification (FHC) and coordination for receipt and storage at Avon Park, FL. A point of contact for coordination will be provided with the invitation to participate in the technical experimentation event.

7. **Frequency Requirements**: **If your experiment will be radiating on a given frequency or frequency band, you must have prior approval to transmit on that frequency**. Prior approval may include compliance with Federal Communications Commission (FCC) Title 47, Part 15, a **Special Temporary Authority (STA),** or Part 5 **experimental license from the FCC**. You must have National Telecommunications and Information Administration (NTIA) frequency approval if your experiment includes Government-owned equipment and you will be operating within a Federal Band. **Respondents are advised to not wait for confirmation of selection/invitation to the event before requesting a STA or experimental license from the FCC**. Your authority to radiate must be emailed directly to **tech_exp@socom.mil** by **1 October 2018**. All frequency questions shall be directed to the USSOCOM Technical Experimentation team at the email above. **Respondents shall not contact the Florida Frequency Manager directly.**

8. Human Subjects. It is not anticipated that activities being conducted in this TE event will require the use of research or experimentation involving human subjects. Technology experiment submissions will be reviewed for potential research or experimentation involving human subjects. Any submission that is determined to potentially include research or experimentation involving human subjects will be required to adhere to DoD Instruction 3216.02 “Protection of Human Subjects and Adherence to Ethical Standards in DoD Supported Research” and ensure appropriate

Institutional Review Board and DoD Human Research Protections Office approvals prior to conducting those activities.

9. Other Special Requirements: DO NOT SUBMIT PROPOSALS OR MARKETING DEMONSTRATIONS. SUBMIT TECHNOLOGY EXPERIMENTATION NOMINATIONS ONLY. EXPERIMENTATION NOMINATION SUBMITTALS FOR THIS RFI WILL ONLY BE ACCEPTED UNTIL THE CLOSING DATE OF 10 September **2018, 12:00 Noon Eastern Time**, for the requirements stated above. No contracts will be awarded based solely on this announcement or any subsequent supplemental RFI announcements.

C. SUBMISSION INSTRUCTIONS:

Technology experimentation nominations shall be submitted electronically via the Vulcan platform. Associated technology experiments with distinctly different uses or applications should have a separate nomination submitted by each respondent. USSOCOM personnel will review submissions to determine whether an experiment submission will be accepted for invitation to attend the TE event.

A complete submission consists of:

- Completing a Vulcan Scout Card (Go to Vulcan Scout Card). Once the Scout Card is completed, complete the Supplemental Information Form in Vulcan and attach a White Paper describing your technology.
  - Devices with radio frequency emissions must state the intended frequency or frequencies used by the device(s).
- Instructions on how to safely use the technology (as needed).
- An FCC STA, FCC experimental license, or NTIA document (for developmental radio frequency emitting devices). If neither is available at the time of submission, provide status of your FCC/NTIA request.
- Experiment plan.
- If applicable, a picture of the device with a short description of the size (shows the dimensions or places the device next to a ruler, currency, or man-sized object for comparison).

Selected respondents will be invited to participate in USSOCOM experiments. USSOCOM shall provide venues, supporting infrastructure, and assessment (operational and technical, based on availability of resources and written request as discussed above) personnel at no cost to invited respondent(s). **All respondents' submission costs, travel costs, technology experiments, and experimentation associated costs will be at the respondents' expense**. The TE venue will only provide basic access to training areas or ranges (if approved and applicable) to conduct experiments, a facility to connect to the internet, basic venue infrastructure including frequency coordination/deconfliction, and shore power. Invited respondents must be prepared to be self-sufficient during the execution of their experiments and not dependent on venue resources. On a case-by-case basis and at the discretion of USSOCOM, respondents invited to the event may be asked to complete a Vendor Loan Agreement (VLA) (RFI Notice Attachment 4). Do not submit the VLA form unless instructed by USSOCOM to do so.

Time and space will be made available for respondants to conduct real-time modifications and updates to technologies. Respondants are advised to bring all tools and equipment necessary to present/operate their technology at the event.

D. BASIS FOR SELECTION TO PARTICIPATE:

Selection of respondents to participate shall be based on the extent to which the technology represents a potential capability increase to Special Operations Forces.

Other considerations include:

- Technical maturity
- Relevance of or adaptability to military operations/missions
- Relevance to current operational needs
- Relevance to event focus areas

E. ADDITIONAL INFORMATION: All efforts shall be made to protect proprietary information that is clearly marked in writing. Lessons learned by USSOCOM from these experiments may be broadly disseminated, but only within the Government. If selected for participation in Technical Experimentation, respondants may be requested to provide additional information that will be used in preparation for the experiments.

Future TE events with TENTATIVE themes/focus areas, locations, ANTICIPATED dates and RFI open periods are as follows:

Number	**Theme/Focus Area**	**Location**	**Event Dates**	**RFI Open Period**
TE19-2	Sensitive Site Exploitation/Hyper Enabled Operator (-)	Muscatatuck Urban Training Center, IN	25-29 Mar 2019	3 December 2018-9 January 2019

Respondants invited to this event are encouraged to contact each other using the social media through USSOCOM Technical Experimentation. While USSOCOM Technical Experimentation has access to several social media, the preferred collaboration social media link is LinkedIn www.tinyurl.com/LinkedIn-SOCOMTE.

F. USE OF INFORMATION: The purpose of this notice is to gain information leading to Government/Industry collaboration for development of USSOCOM technology capabilities and to assist in accelerating the delivery of these capabilities to the SOF warrior. All proprietary information contained in the submission and technology experimentation shall be appropriately marked. The Government will not use proprietary information submitted from any one firm to establish future capability and requirements.

G. SPECIAL NOTICE:

1. Federally Funded Research and Development Centers (FFRDCs) or contractor consultant/advisors to the Government will review and provide support during evaluation of submittals. When appropriate, non-Government advisors may be used to objectively review a particular functional area and provide comments and recommendations to the Government. All advisors shall comply with procurement integrity laws and shall sign non-disclosure statements. The Government shall take into consideration requirements for avoiding conflicts of interest and ensure advisors comply with safeguarding proprietary data. Submission in response to this RFI constitutes approval to release the submittal to approved Government support contractors.

2. There will be foreign military attendees, who are interested in the capabilities being demonstrated at the TE event. Respondants are ultimately responsible for complying with all International Trafficking in Arms (ITAR)/Export Administration Regulations (EAR) requirements associated with their equipment. USSOCOM event organizers will restrict access as necessary to assist in protecting ITAR/EAR related technology demonstrations.

H. Per Federal Acquisition Regulation (FAR) 52.215-3, Request for Information or Solicitation for Planning Purposes (Oct 1997):

1. The Government does not intend to award a contract on the basis of this RFI notice or to otherwise pay for the information.

2. Although "proposal" and "respondent" are used in this RFI, your responses will be treated as information only. It shall not be used as a proposal.

3. In accordance with FAR 15.209(c), the purpose of this RFI is to solicit technology experimentation candidates from research and development organizations, private industry, and academia for inclusion in future experimentation events coordinated by USSOCOM.

Primary Point of Contact:
tech_exp@socom.mil

(813) 826-4646